

Patent Claims:

1. A solution for etching copper or a copper alloy, said solution having a pH on the order of 4 or less, comprising:

- a) at least one oxidizing agent selected from the group comprising hydrogen peroxide and peracids and
b) at least one substance selected from the group comprising aromatic sulfonic acids and salts of the aromatic sulfonic acids

characterized in that the solution is free of sulfate ions.

2. The solution according to claim 1, characterized in that it further comprises at least one N-heterocyclic compound.

3. The solution according to claim 2, characterized in that the concentration of the N-heterocyclic compounds is in the range of from about 0.1 to about 300 g/l.

4. The solution according to any one of claims 2 and 3, characterized in that at least one N-heterocyclic compound is selected from the group comprising mono-N, di-N, tri-N and tetra-N heterocyclic compounds.

5. The solution according to any one of claims 2 – 4, characterized in that at least one N-heterocyclic compound is selected from the group comprising pyridine, N-methyl pyrrolidone, adenine, guanine, uric acid, imidazole, pyrazole, piperazine, pyrrolidone, pyrroline, triazole, tetrazole and the derivatives thereof.

6. The solution according to any one of the preceding claims, characterized in that the concentration of the substances is in the range of from about 5 to about 250 g/l.

7. The solution according to any one of the preceding claims, characterized in that at least one salt of the aromatic sulfonic acids is selected from the group comprising sodium and potassium salts.

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8. The solution according to any one of the preceding claims, characterized in that the aromatic part of at least one aromatic sulfonic acid or of at least one salt of the aromatic sulfonic acids comprises at least one phenyl group.

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9. The solution according to claim 8, characterized in that at least one phenyl group is substituted by one or more radicals selected from the group comprising nitro, amino, hydroxy, halogen, C₁ - C₅-alkyl radicals and C₁ - C₅-alkoxy radicals.

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10. The solution according to any one of the preceding claims, characterized in that at least one aromatic sulfonic acid is selected from the group comprising benzene sulfonic acid, phenol sulfonic acid, toluene sulfonic acid, amino benzene sulfonic acid and naphthalene sulfonic acid.

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11. The solution according to any one of the preceding claims, characterized in that the solution comprises at least one adjuvant selected from the group comprising polyethylene glycol, polypropylene glycol and the derivatives thereof.

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12. Use of the solution according to any one of claims 1 - 11 for producing electrical circuit carriers or for the semiconductor technique in vertical and/or horizontal lines or for producing leadframes in RTR systems or for producing multipoint connectors and contacts in switches, plug and socket connectors, sockets and plugs.

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13. A method for depositing metal to the surface of copper or a copper alloy, said method comprising the following method steps:

- a) contacting the surface with the solution in accordance with any one of claims 1 - 11 and
- b) coating the surface with at least one metal.

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14. The method according to claim 13, characterized in that the substrate is selected from the group comprising electrical circuit carriers, leadframes, multipoint connectors and contacts in switches, plug and socket connectors, sockets and plugs.

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15. The method according to any one of claims 13 and 14, characterized in that the substrate is contacted with an acidic cleaning fluid prior to method step a).

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16. The method according to any one of claims 13 - 15, characterized in that the substrate is contacted with sulfuric acid prior to method step b).

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17. The method according to any one of claims 13 - 16, characterized in that the metal is selected from the group comprising copper, tin, gold, silver, palladium, bismuth and nickel.

18. The method according to claim 17, characterized in that the metal is electroless nickel-gold or chemical tin.

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19. The method according to any one of claims 13 - 18 for producing electrical circuit carriers or for the semiconductor technique in vertical and/or horizontal lines or for producing leadframes in RTR-systems.